

IN THE SPECIFICATION:

Please replace the paragraph beginning on page 15, line 22 as follows:

Referring first to Figure 1, a device 10 for supporting a heart valve in a patient is shown. In the illustrated example, the left ventricle 12 of a patient's heart is shown in cross section with a mitral valve 14 for supplying blood into the ventricle 12. Mitral valve 14 includes an annulus 16 generally lying in a plane and a plurality of native chordae tendinae or chords 18, 20 respectively connected with a pair of valve leaflets 22a, 22b at one end and papillary muscles 24, 26 at an opposite end. In a normally functioning heart, chords 18, 20 support the anterior valve leaflet[[s]] 22a[[.]] and posterior valve leaflet 22b between open (diastolic) and closed (systolic) positions to selectively allow and prevent blood flow into and out of left ventricle 12. Blood enters left ventricle 12 through mitral valve 14 and is expelled during the subsequent contraction of the heart muscle through aortic valve 28. It will be appreciated that the present invention is applicable to heart valves other than the mitral valve in various of its aspects to be described below.

Please replace the paragraph beginning on page 16, line 13 as follows:

Device 10 more particularly includes a support member 30 configured for attachment to the heart valve annulus 16 and a post 32 extending from support member 30 and configured to extend away from the plane of annulus 16. A connector which, in this embodiment, is in the form of at least one flexible tensile member, is coupled with post 32 and configured for attachment to at least one of the anterior and posterior leaflets 22a, 22b. In this embodiment of the invention, post 32 is a hollow, J-shaped member having a longer section 32a and a shorter curved section 32b. Also, post 32

may be hollow as shown with flexible tensile members 34 extending through the post and exiting at shorter section 32b. Flexible tensile members 34 may include suture needles for affixing the tensile members to the edges of the anterior and posterior valve leaflets 22a, 22b as described below. Other connectors suitable for directly or indirectly coupling post 32 or a post of different configuration to the anterior and posterior valve leaflets 22a, 22b may be utilized as well and some variations are described herein below.

Please replace the paragraph beginning on page 17, line 4 as follows:

As shown in Figure 2, flexible tensile members 34 may completely substitute for one set of chordae tendinae 18 (Fig. 1) or, as an alternative, one or more defective chords, such as a lengthened chord 18a (Fig. 1), may be replaced with an artificial chord or flexible tensile member in accordance with the invention. As shown in Figure 2, all of the native chords 18 of the patient have been removed and device 10 has been affixed by suturing ring-shaped support 30 to valve annulus 16 using stitches (not shown) and by affixing flexible tensile members or artificial chords 34 to anterior and posterior leaflets 22a, 22b. As further shown in Figs. 2 and 24 post 32 can extend along posterior outer wall 12a of the heart 12. Flexible tensile members 34 may be affixed to mating edges of anterior and posterior valve leaflets 22a, 22b by being stitched thereto as shown in Figure 3 using suitable pads or suture supports 40, 42. It will be appreciated that the remaining native chords and other artificial chords have been omitted in Figure 3 for clarity. A crimp member 44 is also shown in Figure 3 for fixing flexible tensile members 34 at the desired length. That is, after chords 34 have been affixed to anterior and posterior valve leaflets 22a, 22b as shown in Figure 3, the

distance between the lower free margins or edges of leaflets 22a, 22b and section 32b of post 32 may be adjusted to ensure effective coaptation or mating of the anterior and posterior valve leaflets 22a, 22b in their closed systolic configuration. When this is achieved, crimp member 44 is crimped onto flexible tensile members 34 to retain flexible tensile members 34 at this distance and maintain the effective coaptation. Ring-shaped support member 30 may be comprised of two integrated sections with one being a [[curved]] generally curvilinear section 30a for coupling adjacent to the posterior leaflet 22b and one being a straight section 30b for coupling adjacent to the anterior leaflet 22a as is the case with certain conventional annuloplasty rings. Figures 4, 5 and 6 illustrate the hollow nature of the support post and the use of a number of flexible tensile members or artificial chords 34, depending on the patient's needs.

Please replace the paragraph beginning on page 24, line 6 as follows:

Figure 21 illustrates a mitral heart valve 330 comprised of [[first]] respective anterior and [[second]] posterior leaflets [[322]] 332, 334 that engage one another at an area of coaptation 336 defining a selectively opened and closed portion of the valve 330. Valve 330 has a malformation, however, in the form of a gap 338 that is typically the result of an ischemic condition, as discussed in the background, which pulls one portion or leaflet 334 of the mitral valve 330 away from the other leaflet 332.

Please replace the paragraph beginning on page 24, line 12 as follows:

Figures 22, 22A and 23 illustrate a valve support device 350 for correcting valve malformations such as that shown in Figure 21. These devices are especially useful for treating ischemic conditions in which one side of the mitral valve pulls away

from another side resulting in imperfect coaptation of the respective anterior and posterior valve leaflets 332, 334. Specifically, device 350 is in the form of a ring-shaped support member 352 having a selectively adjustable and lockable portion 354. As shown best in Figure 22, ring-shaped support member 352 may be reformed into the shape shown in phantom and retained in that shape. Alternatively, device 350 may be formed with a permanent asymmetric shape about both axes x,y. As shown in Fig. 22, a first or major axis "x" extends along the maximum dimension of the support member 352, while a second or minor axis "y" bisects the support member 352 along the "x" axis. The major axis "x" generally divides an anterior section 352a from a posterior section 352b of support member 352. The intersection of the "x" and "y" axes defines a valve flow axis 353 extending normal to major axis "x" and minor axis "y." As shown in Figure 23, the ability to squeeze portion 354 of ring-shaped support member 352 together and retain portion 354 in that position will bring the anterior and posterior valve leaflets 332, 334 together to close gap 338. Figure 22A illustrates one manner of allowing selectively adjustable and lockable positioning of ring-shaped support member 352. In this regard, respective socket segments 354a, 354b, 354c receive balls 356 therebetween and further receive a wire 358 which may be tensioned and locked in place with a set screw 360 by use of a tool 362. When wire 358 and socketed segments 354a-d and balls 356 are loosened, adjustability of section 354 is possible. Once the adjustment in position is made, wire 358 is tensioned to bring the balls and sockets together and then lock in place using tool 362. This retains the adjusted shape. As also shown in Figs. 22 and 23, support member 352 in this embodiment is a ring shaped member that is substantially "D" shaped when viewed in a direction parallel to the valve-flow axis 353 (that is, in top view or bottom view). The anterior section 352a is

configured to form a substantially straight portion of the "D"-shape, and the posterior section 352b is configured to form a substantially arcuate portion of the "D"-shape. As also shown in Figs. 22 and 23, support member 352 in this embodiment is a ring shaped member that is substantially "D" shaped when viewed in a direction parallel to the valve-flow axis 353 (that is, in top view or bottom view). The anterior section 352a is configured to form a substantially straight portion of the "D"-shape with first and second ends at opposite ends of the straight portion, and the posterior section 352b is configured to form a substantially arcuate portion of the "D"-shape.

Please replace the paragraph beginning on page 25, line 10 as follows:

Figure 24 illustrates another alternative device 370 for supporting a [[heart]] mitral valve 372. Device 370 again comprises a valve support member 374 adapted to be connected with the valve annulus 376, such as by suturing or other mechanical fastening means. A post 378 and flexible tensile members 380 are connected with support member 374 as described generally above in Fig. 2 to support anterior valve leaflet[[s]] 382[[.]] and posterior valve leaflet 384. In this embodiment, one portion 374a of valve support member 374 may be bent out of the plane containing another portion 374b and retained in that position to fix the mitral valve 372 in a desired position. In the embodiment shown in Fig. 24, a posterior segment 374b overlying posterior leaflet 384 is bent downwards relative to an anterior segment 374a overlying anterior leaflet 382. Any suitable manner of retaining the adjusted shape may be used, including the manner described with respect to Figure 22A. Alternatively, device 370 may be permanently formed with a nonplanar shape, such as the shape shown in Fig. 24. It will be appreciated from a review of Figs. 2, 22 and 24 that the view of Figs. 2 and

24, for example, is taken with the anterior portion 376a of the valve annulus 376 and anterior segment 374a being on the left, and with the posterior portion 376b of the valve annulus 376 and posterior segment 374b being on the right. Therefore, the view of Fig. 24 is in a direction generally parallel to the major axis "x." The mitral valve annulus 376 will assume the shape of the attached device 370. That is, the posterior portion 376b of the annulus 376 will be moved and fixed into a non-planar configuration, i.e., out of the natural position of the posterior valve annulus 376b. In the embodiment shown in Fig. 24, the posterior portion 376b of annulus 376 is moved downward relative to the anterior portion 376a of annulus 376. The modified shape shown in phantom in Fig. 22 may also[[,]] be combined with the modified shape shown in Fig. 24 for ring-shaped support member 374.